

CLAIMS

1. Drive system for regulating devices in motor vehicles with a housing in which
5 a drive element of the regulating device, a disc armature motor with an armature disc and a planet wheel transmission are arranged which has a hollow wheel with internal toothing fixed on the housing, an output internal geared wheel connected to the drive element of the regulating device, and a radially flexible ring whose external toothing meshes partially with the internal
10 toothing of the hollow wheel fixed on the housing and of the output hollow wheel and whose inner sleeve face rolls on rollers which are mounted on a drive hub connected to the armature disc,
- characterised in that**
- 15 a journal (50) of the output internal geared wheel (5) extending over a significant part of the length of a fixed drive axle (40) is centred between the fixed drive axle (40) and a drive hub cylinder (60) of the drive hub (6).
- 20 2. Drive system according to claim 1, **characterised in that** the length of the drive hub cylinder (60) corresponds substantially to the height of the rollers (71, 782).
- 25 3. Drive system according to claim 1 or 2, **characterised in that** the fixed drive axle (40) is connected to a first housing cover (41) of the housing and is supported on a second housing cover (42) of the housing.
- 30 4. Drive system according to at least one of the preceding claims, **characterised in that** the fixed drive axle (40) and the drive hub cylinder (60) are made from steel or a steel alloy and the journal (50) centred between the fixed drive axle (40) and the drive hub cylinder (60) is made from sintered metal.
- 35 5. Drive system according to at least one of the preceding claims, **characterised in that** the hollow wheel (20) fixed on the housing is connected to a base disc (2) or is formed as a part of a base disc (2) which supports permanent magnets (32) of the disc armature motor (3) and has centring elements (91,

92) which are arranged on the periphery and centre at least one of the two housing covers (41) relative to the base disc (2).

- 5 6. Drive system according to claim 5, **characterised in that** socket areas are worked into the outwardly aligned edge of the hollow wheel (20) fixed on the housing and are adapted at least in sections to the contour of the permanent magnets (32) of the disc armature motor (3).
- 10 7. Drive system according to claim 5 or 6, **characterised in that** the socket areas are formed in the outwardly directed edge of the hollow wheel (20) fixed on the housing as radially outwardly opening sockets.
- 15 8. Drive system according to one of the preceding claims 5 to 7, **characterised in that** the internal toothing (21) of the hollow wheel (20) fixed on the housing is formed in a metal edge of the base disc (2).
- 20 9. Drive system according to at least one of the preceding claims 5 to 8, **characterised in that** the centring elements (91, 92) of the base disc (2) correspond to counter centring elements (93, 94) of the first housing cover (41) which support the fixed drive axle (40).
- 25 10. Drive system according to at least one of the preceding claims 5 to 9, **characterised in that** the base disc (2) has a cropped peripheral edge (22)
- 30 11. Drive system according to at least one of the preceding claims 5 to 10, **characterised in that** the base disc (2) has profiling for positioning or securing the position of the permanent magnets (32).
- 35 12. Drive system according to at least one of the preceding claims 5 to 10, **characterised in that** the base disc (2) is connected through stamped indentations and/or cropped bracket plates to a disc preferably of plastics supporting the permanent magnets (32).
13. Drive system according to one of the preceding claims 5 to 12, **characterised in that** the base disc (2) is made of plastics in which socket areas are formed

which are adapted at least in sections to the contour of the permanent magnets (32) of the disc armature motor (3).

14. Drive system according to one of the preceding claims 5 to 12, **characterised in that** the base disc (2) consists of plastics in which the permanent magnets (32) of the disc armature motor (3) are cast.
15. Drive system according to at least one of the preceding claims 5 to 14, **characterised in that** the socket areas of the base disc (2) are made from bracket plates which are stamped out or bent round from the base disc (2).
16. Drive system according to at least one of the preceding claims 5 to 14, **characterised in that** the socket areas of the hollow wheel (20) fixed on the housing or of the base disc (2) surround the permanent magnets (32) so far that a defined position of the permanent magnets (32) is ensured.
17. Drive system according to one of the preceding claims, **characterised in that** the ferrite metal parts of the drive system are thickened up by tailored blanks only in the region of the flux-conveying short circuits.
18. Drive system according to at least one of the preceding claims, **characterised in that** the drive hub (6) is made from a steel stamped part, a sintered metal and/or a glass-fibre or carbon-fibre reinforced plastics.
19. Drive system according to claim 18, **characterised in that** the drive hub (6) has several cropped angles (63) formed out from the surface.
20. Drive system according to claim 18 or 19, **characterised in that** the drive hub cylinder (60) and/or the roller bearings (61, 62) are designed as passages through the drive hub (67).
21. Drive system according to claim 20, **characterised in that** the outer cylindrical surface of the passages is supported by hardened steel bushes with collar.

22. Drive system according to claim 20 or 21, **characterised in that** the rollers (71, 72) are mounted and preferably arranged asymmetrically through sliding or rolling bearings (65) on the passages or with bearing bolts (63, 64) connected to the passages.
- 5
23. Drive system according to at least one of the preceding claims, **characterised in that** the rollers (71, 72) have grooves (73) for guiding the radially flexible ring (8).
- 10
24. Drive system according to at least one of the preceding claims, **characterised in that** circumferentially active damping elements (56) are integrated in the output hollow wheel (5).
- 15
25. Drive system according to at least one of the preceding claims, **characterised in that** the output hollow wheel (5) is connected to a loop spring brake.
- 20
26. Drive system according to at least one of the preceding claims, **characterised in that** the drive element (10) of the regulating device is connected in the axial direction to the output hollow wheel (5).
27. Drive system according to claim 26, **characterised in that** holding clips (11) are integrated in the second housing cover (42) for axially fixing the drive element (10) of the regulating device.
- 25
28. Drive system according to one of the preceding claims 25 to 27, **characterised in that** damping elements and/or a loop spring brake is/are mounted between the output hollow wheel (5) and the drive element (10).
- 30
29. Drive system according to at least one of the preceding claims, **characterised in that** the output hollow wheel (5) is integrated in the drive element (15) of the regulating device.
- 35
30. Drive system according to at least one of the preceding claims, **characterised in that** the output hollow wheel (5) is formed in one piece or in two pieces of plastics and a preferably metal bearing material, more particularly a sintered metal.

31. Drive system according to at least one of the preceding claims 27 to 29, **characterised in that** a steel ring is mounted in the output hollow wheel to support the radial forces acting on the output hollow wheel.
- 5 32. Drive system according to at least one of the preceding claims, **characterised in that** the radially flexible ring (8) has a supporting metal ring preferably of steel or a steel alloy.
- 10 33. Drive system according to at least one of the preceding claims, **characterised in that** the radially flexible ring (8) has a loop spring as supporting element.